GPS Vehicle Tracker

USER MANUAL (Model: VT310N)

Please read carefully before operation

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1. Product Overview

VT310N is a GPS/GSM/GPRS tracking device which is specially developed and designed for vehicle real-time tracking and security. With superior GPS and GPRS modules, VT310N has good sensitivity and stable performance. Especially, VT310N is well designed to work with our web-based tracking system, which is suitable for a company to establish a tracking server to provide real-time tracking solutions to their customer or manage their fleet.

2. Applications

- Vehicle Real Time Tracking
- Car Security/Anti-Hijack
- Fleet Management

3. Product Function and Specifications

3.110 Product Function

- Tracking via SMS or GPRS (TCP/UDP)
- Current location report
- Tracking by time interval
- Tracking by distance interval
- Position logging capacity up to 10000+ waypoints
- SOS panic button
- Geo-fencing control
- Overspeed alert
- Engine-cut in safty mode
- Built-in motion sensor for power saving
- GOOGLE map URL for location via SMS,which shows you location on map via mobilephone.
- Remote listen in/Wiretapping
- Get location physical address name by SMS request & from the web-platform.
- Mileage calculation with longitude and latitude via SMS,view mileage data via GPS web-based tracking centre system.
- I/O: 5 digital inputs, 3 negative and 2 positive triggering; 5 outputs.
- Analog Input: 2 Analog Input For Temperature sensor & Fuel remote monitoring
- Can equip with RFID kit for auto alarm functions

3.2 Specifications

Items	Specifications
Dimension	117*85*26mm
Weight	185g
Charging Voltage	9V~24V
SIM card type	3V
Power consumption	Active mode(peak) < 1.0A Active mode(avg.) < 300mA
Operating Temperature	-30℃~+75℃
Humidity	Up to 75% non-condensing
External Antenna	Connected via 50Ω coax connector
External SIM Card	Connected via SIM card connector
Button	1 SOS and 1 power on/off
Microphone	Optional
Transmit Power	Class 4(2W) for E-GSM 900 and 850 Class 1(1W) for DCS 1800 Class 1(1W) for PCS 1900
Sensitivity	-104dBm minimum for E-GSM 900 AND 850 -102dBm minimum for DCS 1800 -102dBm minimum for PCS 1900
GPS Chip	Latest GPS SIRF-Star III chipset
GPRS	Multi-slot Class 8(4Rx, 1Tx., 5slot Max.) Support all 4 coding schemes(CS-1,CS-2,CS-3 and CS-4) Maximum download speed is 85.6kbps Maximum upload speed is 21.4kbps
Speech Codec	Triple rate Codec Half rate—ETS 06.20 Full rate—ETS 06.10 Enhance full rate—ETS 06.50/06.06/06.08
I/O	5 Digital Input (2 positive triggering and 3 negative triggering) 2 Analog Input Detection 5 Output 1 USB port

4. VT310N and Accessories

VT310N Main Unit

GPS Antenna

GSM Antenna

16P I/O Cable

Relay

5. First Use

5.1 Install SIM Card

Check that the SIM has not run out of credit (test the SIM in a phone to make sure it can send and receive SMS);

Before installing the SIM card, turn off the power for VT310N.

Then install the SIM card as followin

Press the yellow button to take out the card holder
Put a SIM card with credit into the holder like this
Insert the holder with SIM card into theVT310Nwith the chip side downward

5.2 Charging

Connect the device with external power like car battery,and turn on its power switch and it will do charging automatically.

5.3 LED Indications

Push the Power switch to turn on/off VT310N.

GPS LED (Red)	
Flashing (every 0.1 second)	Initializing or back-up battery power is low
Flashing (0.1 second on and 2.9 seconds off)	VT310N has a GPS fix
Flashing (1 second on and 2 seconds off)	VT310N has no GPS fix
GSM LED (Green)	
Flashing (every 0.1 second)	Initializing
Flashing (0.1 second on and 2.9 seconds off)	VT310N is connected to the GSM network
Flashing (1 second on and 2 seconds off)	VT310N is not connected to the GSM network

6. Basic SMS Commands

6.1 Position report

Description: To know the position of your VT310N , send an SMS or make a telephone call directly to VT310N and you will receive an SMS with its location and other information.

Command : W<password>,<000>

Note: The default password is **000000**

Item	Description
ID: 1234567890	The tracker's ID number
ACC=OFF	The engine is turned off
Latitude=23 08 57.58N, longitude=113 18 59.31E	Latitude and longitude information, "N" in latitude means North,"E" in latitude means East,
Speed=0.00Km/h	Speed information
Odometer=0.013km/h	Odometer information
2012-09-26,11:32	Date and time

You can copy this coordinate get from the SMS into http//:maps.google.com and see its location as below:

Another easier way to get VT310N's position:

(a) Call VT310N using your mobile phone.
(b) After listening to the ring for 10 - 20 seconds, hang up the phone.
(c) Then, after 20 second, your mobile phone will receive a position SMS.

6.2 Set function of receiving actual address name via SMS

Description: To know specific address of your VT310N, send an SMS and you will receive an SMS with its location physical address name.

Command:W<password>,<111>

Example:

SMS send: W000000,111

SMS receive: Xinfu 1st Rd, Maonan, Maoming, Guangdong, China

6.3 Get location in google mapURL format

Description: You will get a google map URL after sendind the command, click the URL then the location can be shown directly on Google Maps on your mobile phone.

Command: W<password>,100

Example:

SMS send:W000000,100

SMS Received: as following picture

Note: then by click the URL, you can get the location in Googlemap from your mobilephone, see belowing

6.4 To cut off Engine, immobilize the vehicle

Command: W<password>,020,P,F

Description: P=1, means output1, P=2 means output2 … P=5, means output5

F=0, to disable this output function; F=1, to enable this output function

Example:

SMS send:W000000,020,1,1

If the output1 is connect to oil-cut relay, this command is to enable the engine-cut function, the engine oil pump line will be cut-off to immobilize the vehicle.

While send W000000,020,1,0 is to restore the engine oil pump line and the vehicle can be started again.

6.5 Set over speed alarm

Command :W<password>,005,XX

Description: XX(the speed preset value) XX=00, disable XX=[01<XX<20](unit:10Km)

Example:

SMS send:W000000,005,10

SMS receive:SET OK! SPEED LIMIT:100Km/h

Meaning: If your speed is over 100Km/h, an alarm SMS will send to your phone to warn you.

More commands please refer to appendix 1

7.Set SMS for GPRS tracking

7.1 Set ID by SMS

Command : W<password>,010,ID

Description: every tracker has a unique ID. Tracker ID must be less than 14 digitals

Example:

SMS send:W000000,010,20120823

Meaning: this tracker's ID is 20120823

7.2 Set APN by SMS

Description: W<password>,011, APN name, APN username, APN password

if no username and password required, just put in APN name only.

Command: W<password>,011,APN name,APN username, APN password

7.3 Set IP Address and Port by SMS

Command :W<password>,012,IP,Port

Description: Our online tracking website's IP address is 96.46.8.198 port is 9500

Example:

SMS send:W000000,012,96.46.8.198,9500

We support domain name instead of IP address:

Example: W000000,012,www.global-track.net,9500

7.4 Enable GPRS Function

Command :W<password>,013,X

Description: X=0,close GPRS(Default)

X=1,enable TCP

X=2,enble UDP

7.5 Set Time Interval for Sending GPRS Packet

Command :W<password>,014,XXXXX

Description: XXXXX should be in five digitals and in unit of 10 seconds.

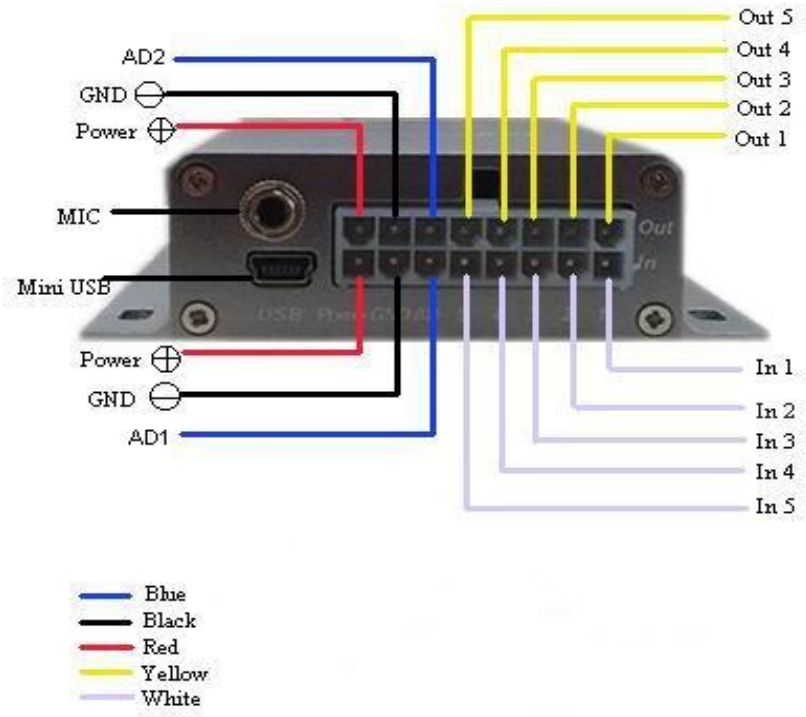
XXXXX =00000, to disable this function

XXXXX =00001~65535, time interval for sending GPRS packet and in unit of 10 seconds

8.Installation

8.1 Install I/O Cable

The I/O cable is a 16-pin cable including power, analog input, negative/positive input and output.

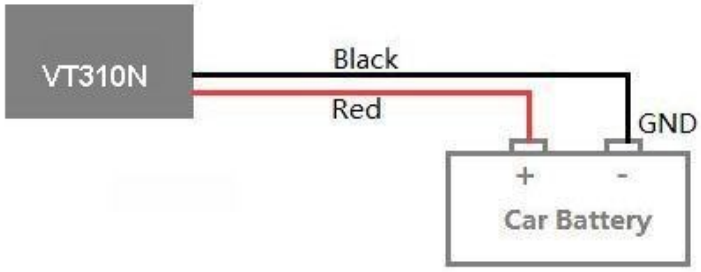


PIN Number	Color	Description
N1/SOS	White	Digital Input 1 (negative triggering)
IN2	White	Digital Input 2 (negative triggering), e.g. detecting status of vehicle door.
IN3	White	Digital Input 3 (negative triggering)
IN4	White	Digital Input 4 (positive triggering), e.g. detecting the ACC.
IN5	White	Digital Input 5 (positive triggering).
AD1	Blue	10 Bits Resolution Analog Inputs. 0~6V DC Detection. It can be used to connect with temperature/fuel sensor etc.
GND	Black	Ground
POWER	Red	DC In (power source). Input voltage: 9V~36V. 12V suggested.
OUT1	Yellow	Output1. It can be used to connect with relay for engineer immobilization.

		Low voltage (0V) when effective and open drain (OD) when ineffective. Output open drain sink voltage (ineffective): 45V max. Output low voltage sink current (effective): 500mA max.
OUT2	Yellow	NC
OUT3	Yellow	E.g. connected with siren
OUT4	Yellow	E.g. unlocked car door
OUT5	Yellow	E.g. Lock car door
AD2	Blue	10 Bits Resolution Analog Inputs. 0~6V DC Detection. It can be used to connect with temperature/fuel sensor etc.
GND	Black	Ground. It can be used to connect with temperature/fuel sensor etc.
POWER	Red	DC In (power source). Input voltage: 9V~36V. 12V suggested. Same as PIN8

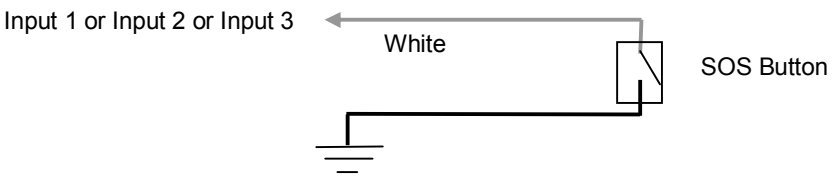
8.1.1 Power/GND

Connect GND (-Black) and Power (+Red) wires to the battery of vehicle.

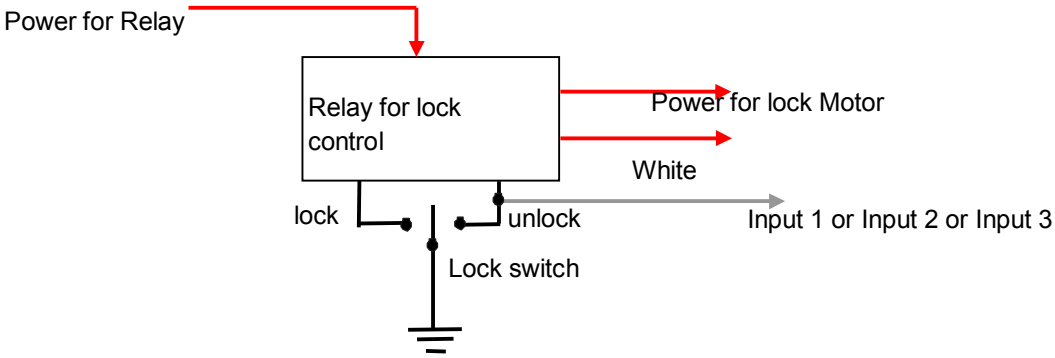


8.1.2 Digital Input (Negative Triggering)

E.g. Detecting SOS button

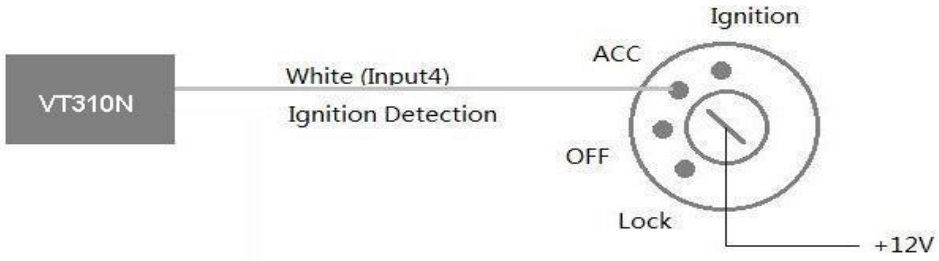


E.g. Detecting vehicle door open/close



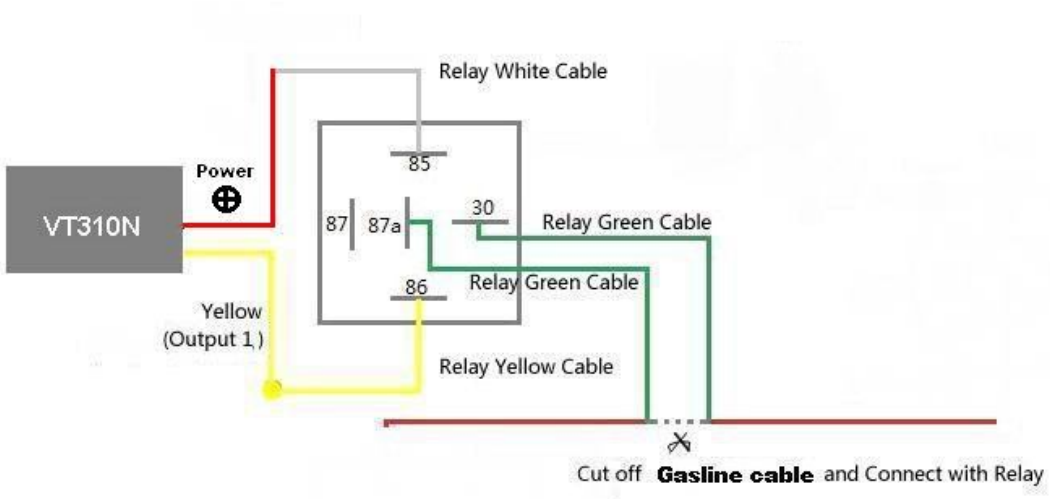
8.1.3 Digital Input (Positive Triggering)

E.g. Detecting engine on/off status



8.1.4 Output

E.g. Control fuel-cut



8.1.5 Analog Input (PIN6/AD2)

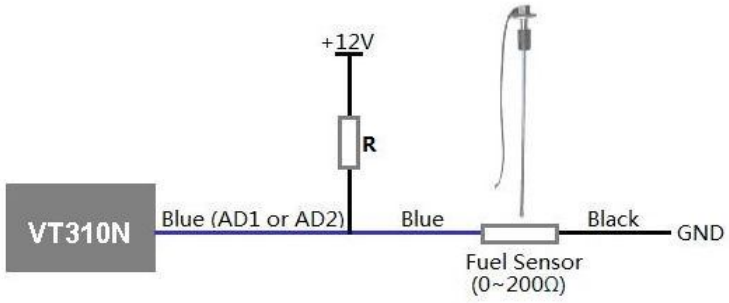
8.1.5.1 Analog Input Application 1– Detect External Power Voltage

Input range：0-6V

Voltage Caculating Formula: input voltage=(AD*6)/1024

0x0377=>887(Decimal)=>(887*6)/1024=5.1972V(Voltage)

OxO2FB=>763(Decimal)=>(763*6)/1024=4.4707(Voltage)



Note:

Fuel level sensors supplied by our company are resistance-type sensors with output resistance: 0-200Ù (ohm).

For the circuit shown on above figure, if VCC is 12V, R should be 200Ù (ohm) and if VCC is 24V then R should be 600Ù (ohm) to make the input range to AD1 or AD2 is 0-6V.

Below formula is for calculating the fuel percentage left for this fuel level sensor:

$$\text{Percentage Left} = \frac{\text{AD value}}{1024 * 2 - \text{AD value}} * 100\%$$

The value must be converted into decimal, for example, 0x0267 is 615 in decimal.

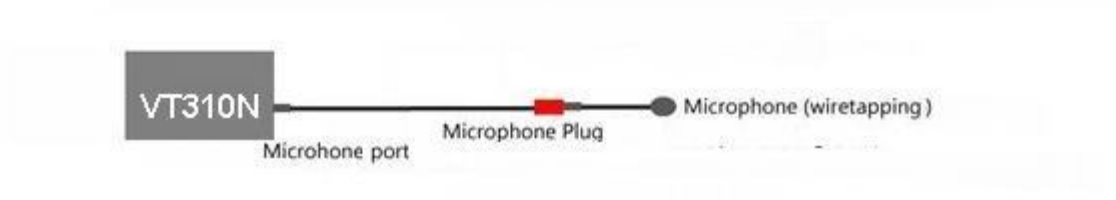
8.2 Install GPS/GSM Antenna

Connect the GSM antenna to the SMA connector which is 'GSM' text labeled. The GSM antenna is non-directional, so you can hide it in any place of vehicle.

Connect GPS antenna to the GPS connector which is 'GPS' labeled. The optimum location for the GPS antenna is on the roof of the vehicle. The covert and GPS antenna are directional, make sure they are facing up and lying as flat as possible. Secure them in place with glue or zip ties.

Note: Do not shield or cover the GPS antenna with any objects containing metal.

8.3 Install Microphone (Optional)



9. Troubleshooting

Problem: Unit will not turn on	
Possible Cause:	**Resolution:**
Wiring was not connected properly	Check and make sure wiring connection is in order.
Battery needs charging	Recharge battery
Problem: Unit will not respond to SMS	
Possible Cause:	**Resolution:**
GSM antenna was not installed properly	Make VT310N connected to GSM network.
GSM Network is slow	Wait for SMS. Some GSM networks slow down during peak times or when they have equipment problems.
Wrong password in your SMS	Insert the correct password
The SIM in VT310N has run out of credit	Replace or top up the SIM card
No SIM card	Insert working SIM card. Check in phone that the SIM can send SMS messages.
SIM card has expired	Check in phone that the SIM can send SMS messages. Replace SIM card if needed.

SIM has PIN code set	Remove PIN code by inserting SIM in you phone and deleting the code
SIM is warped or damaged	Inspect SIM, clean the contacts. If re-inserting does not help try another to see if it will work.
Roaming not enabled	If you are in a different country your SIM account must have roaming enabled
Battery is low	Recharge the unit and the GSM will start working.
Problem: SMS from VT310N states 'Last……'	
Possible Cause:	**Resolution:**
Unit does not have clear view of the sky	Move the antenna of the unit to a location where the sky is visible.
VT310N is in an inner place	Wait for the target to come out

Appendix 1

Configure by Computer

This part shows the basics of how to use the **TOPSHINE Parameter Editor.**

Note: Don't connect VT310N to external battery when configuring.

How to Edit the Parameters of VT310N

Step 1 **Buy one specific USB cable for configuration from Our Company**

USB configure cable

Step2 . **Install USB driver program for the configuration USB cable**

1. Run ‘CP210x_Prolific_DriverInstaller’ to install the driver for the USB data cable.

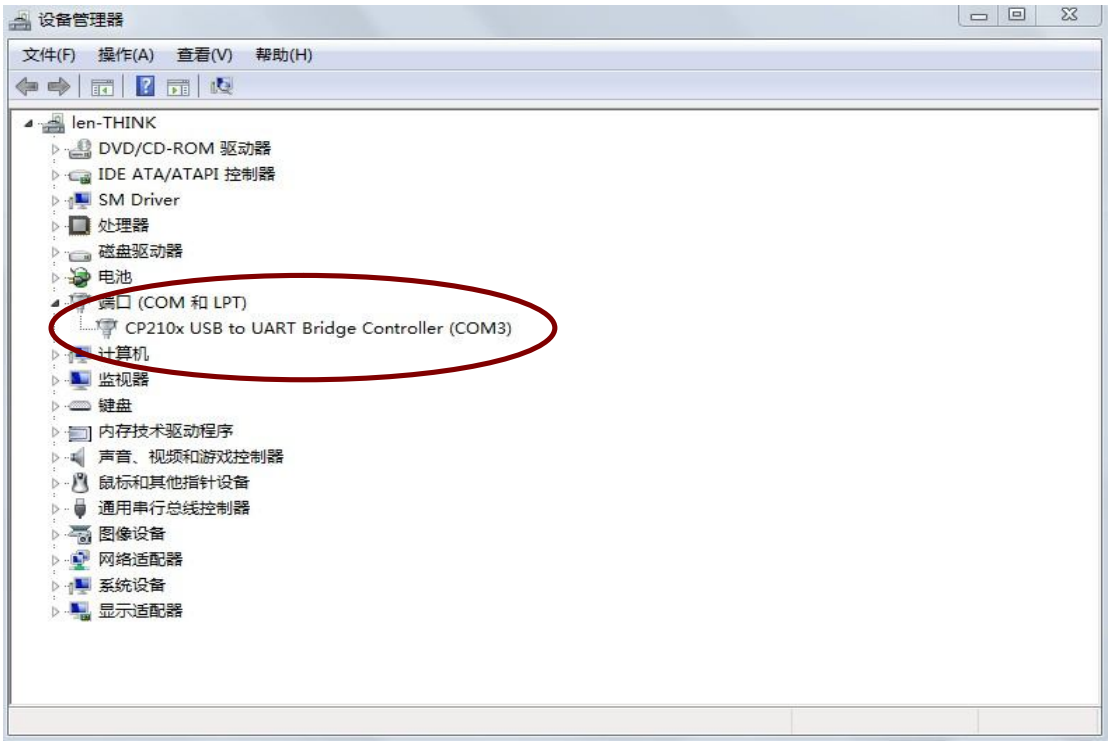
Note: CP210x*_Prolific_DriverInstaller is in the folder ‘USB-232 Driver’ in the CD.*

Connect the USB Data Cable between VT310N and PC.

2.Connect the configuration cable with PC, open device management of your computer,

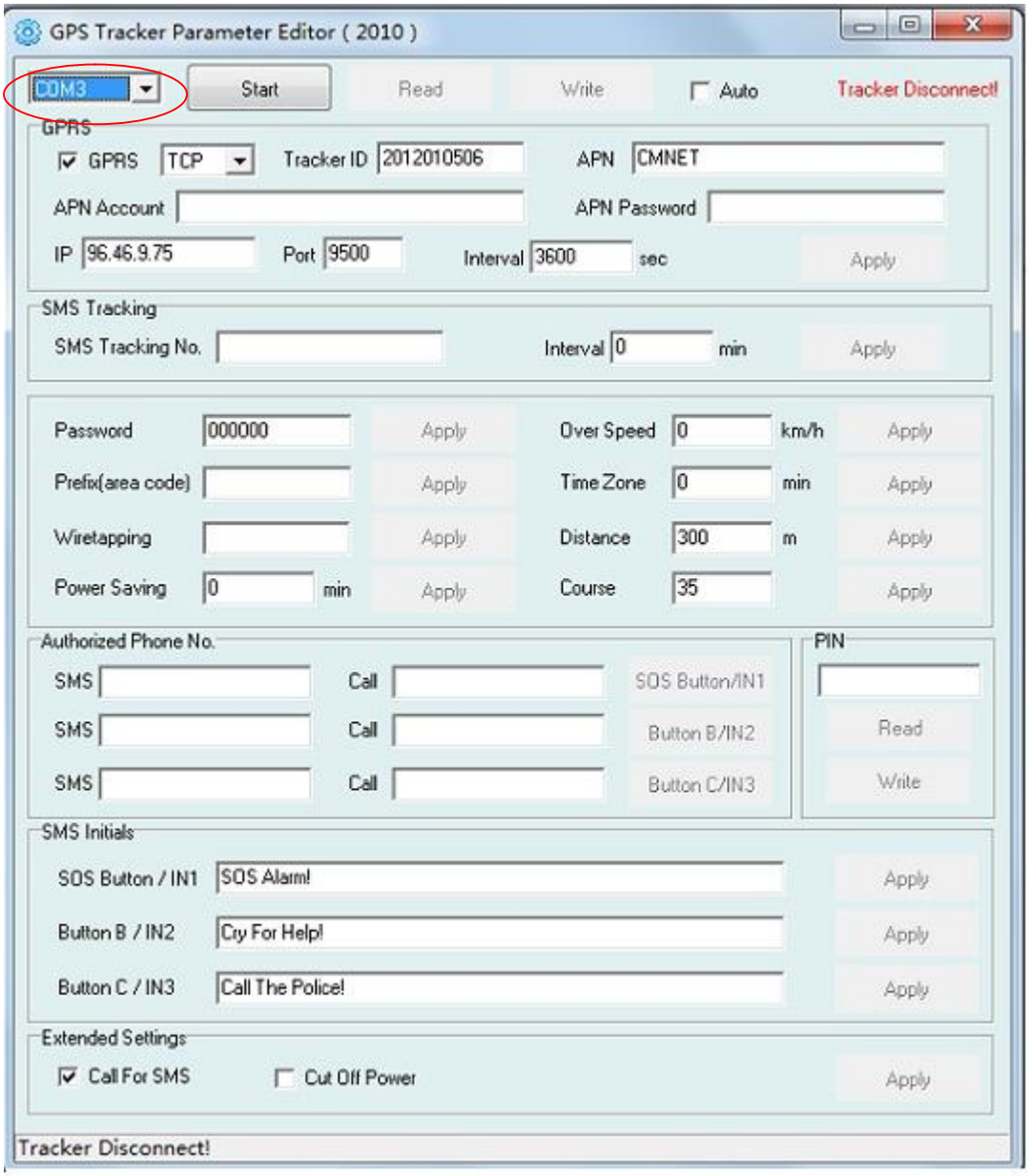
you can find “Prolific USB-to-Serial Comm Port “ ,as following picture shows.

The usb port is virtual comm. Port (com3) in this example,



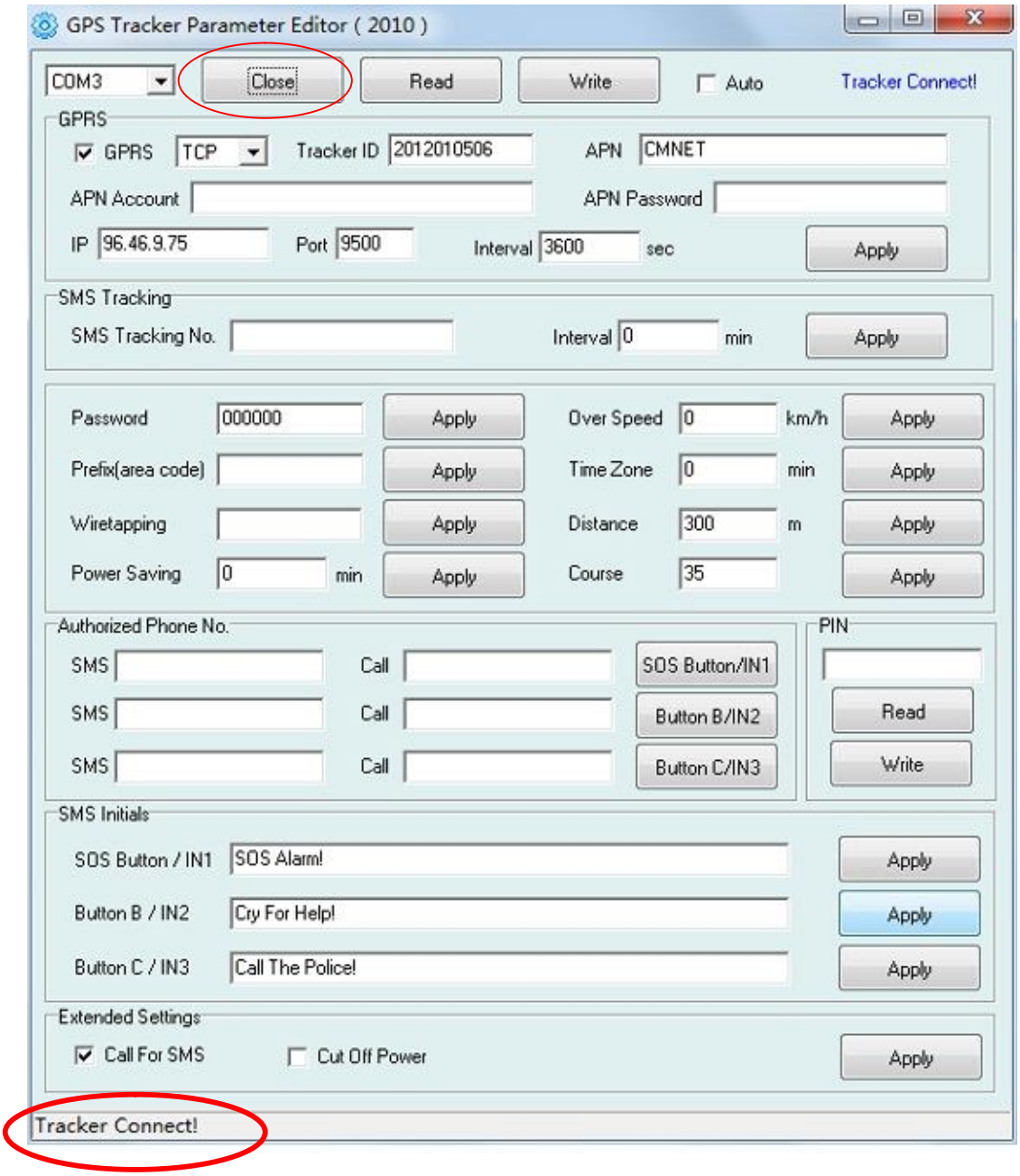
Step3 .**Open the GPS Tracker Parameter Editor**

1. Connect VT310Nwith PC by the configuration cable
2. Confirm VT310Nis in the Power Off states
3. Double click GPS Tracker Parameter Editor.exe and Select the COM Port, following picture shows:

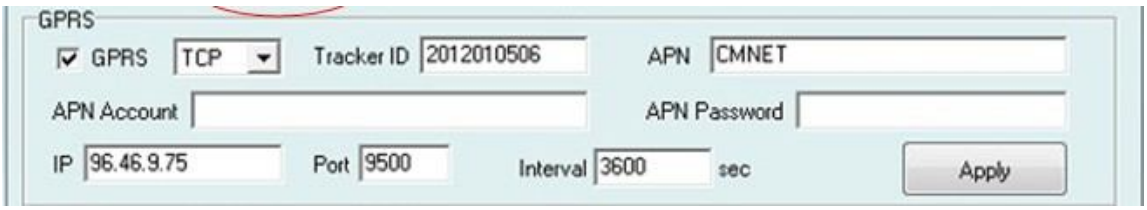


5. Click Start button to open the COM port,

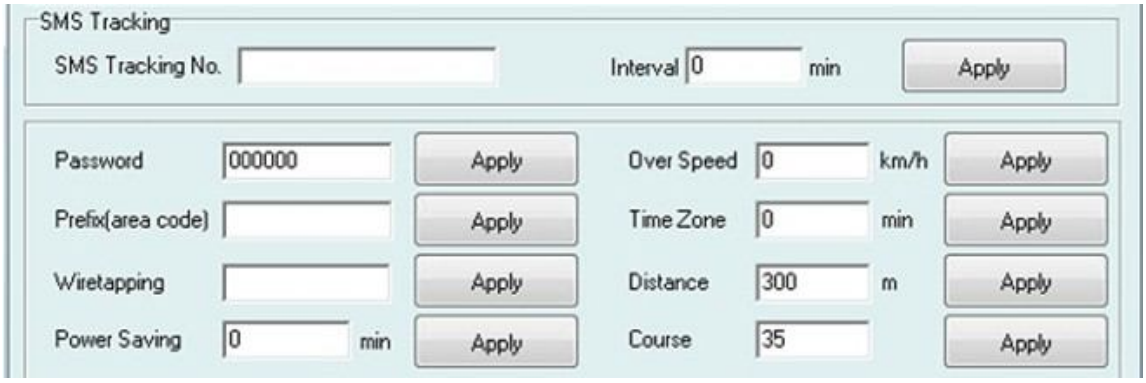
6. Turn on VT310Nand it will connect with the Editor automatic, As soon as they connect successful, all the buttons are availability and the status bar will clue on' **Tracker Connect!**' , then you can Read or Write the VT310N'sParameters.



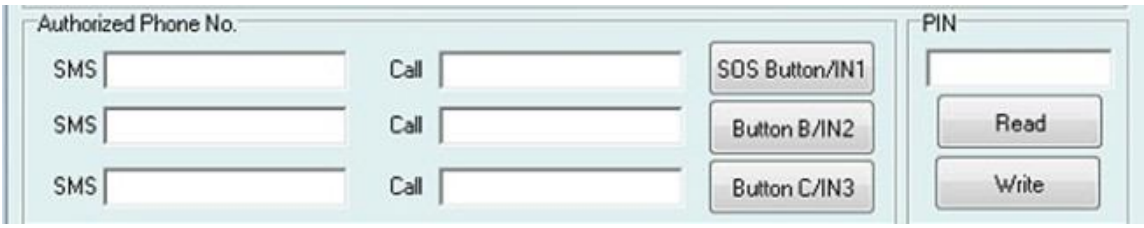
Instruction of parameter settings:



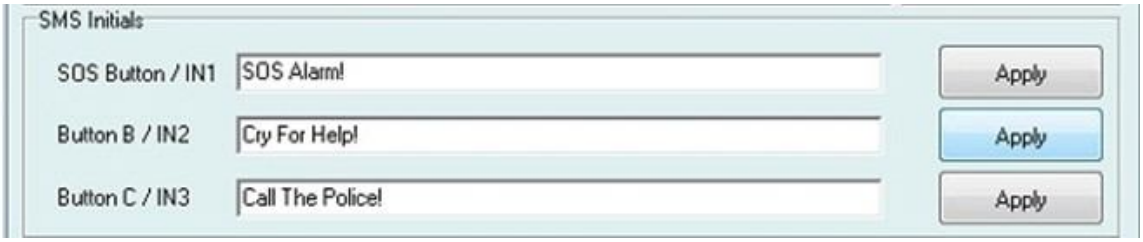
Item	Description
GPRS	Tick to enable GPRS function, select TCP or UDP mode
Tracker ID	Should be unique, in number, maximum 14 bytes
APN, APN Account, APN Passoword	Put your local APN, APN username and password if necessary
IP, Port	Put online tracking server IP and port, our default is IP:www.global-track.net port: 9500
Interval	To put time interval to upload a data



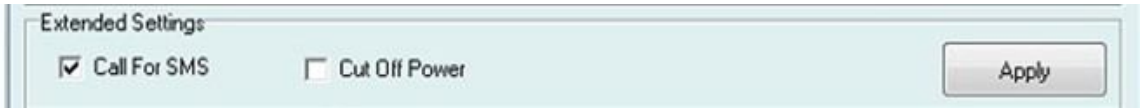
Item	Description
SMS tracking No. Interval	To put a mobilephone number for automatic tracking by SMS at certain time interval in minutes
Password	To set SMS command password, the default is 000000,
Over Speed	To set speed limit for overspeed alarm
Prefix(area code)	To set country code
Time Zone	To set time zone, GMT*60 (minutes), if in west half western hemisphere, "-" is necessary to put ahead
Wiretapping	To set wiretapping mobilephone number
Distance	To set track and upload data by certain distance in meters
Power Saving	To set time enter into standby mode when shaking not detected to save power and gprs data traffic
Course	To set upload data via angle shifting by certain angles



Item	Description
SMS Call SOS Button/IN1	To set Mobilephone No. for SMS or Calling when SOS button/Input 1 is triggered
SMS Call Button B/IN2	To set Mobilephone No. for SMS or Calling when Button B/Input 2 is triggered
SMS Call Button C/IN3	To set Mobilephone No. for SMS or Calling when Button C/Input 3 is triggered



SOS Button/IN1	To customize the reply SMS text when SOS Button/Input 1 triggered
Button B/IN2	To customize the reply SMS text when Button B/Input 2 triggered
Button C/IN3	To customize the reply SMS text when Button C/Input 3 triggered



Call for SMS	Tick it to reply SMS when calling in
Cut off Power	Tick it to send alert when the external power be cut off

APPENDIX 2：Command List

Description	Command	Remarks
Get current location	W******,000	Get current location of VT310N
Get location in google map URL format via SMS	W******,100	http://maps.google.com/maps?f=q&hl=en&q=22.542563,114.077971&ie=UTF8&z=16&iwloc=addr&om=1
Change user's password	W******,001,######	****** is old password ###### is new password
Set interval for automatic timed reports	W******,002,XXX	XXX is the interval in minute. If XXX=000 it will stop tracking
Set preset phone number **for SOS button**	W******,003,F,P,T	F=0, to disable this function; F=1, only sending SMS; F=2, only calling preset phone number; F=3, both SMS and calling (default) P is the button number and should be 1,or 2, or 3. If SOS button is linked to IN1, then P=1. T: Preset phone number (T must be less than 16 digits)
Set over speed alarm When VT310N speeds higher than the preset value, it will send one over speed alarm SMS to the SOS preset number.	W******,005,XX	XX (the speed preset value) =00 , disable =[01<XX<20] (unit: 10Km)

Set Geo-fence alarm (foursquare) When the VT310N moves out of preset scope, it will send one Geo-fence SMS to the SOS preset number.	W******,006,XX	XX (set distance from current central point place) =00, disable =01, 30m =02, 50m =03, 100m =04, 200m =05, 300m =06, 500m =07, 1000m =08, 2000m
Extend Settings	W******,008,ABCDEFGHIJ###	A=0, disable position report function when a call is made to VT310N A=1, enable position report function to get position SMS by Calling VT310N I=0, disable power failure alert I=1, enable power failure alert The functions of BCDEFGHJ are remained for furthur use. ### is the ending character.
Set Geo-fence alarm 017 command is for alarm when tracker moves out the preset scope; 117 command is for alarm when tracker moves in. When the tracker moves in or out, it will send an SMS alarm to the authorized phone number for SOS.	W******,017,data W******,117,data	data is the coordinates which include: Lower-left X, Lower-left Y,Upper-right X,Upper-right Y For example, 11404.0000,E,2232.0010,N,11505.1234,E,2333.5678,N Note: 1. Lower-left X,Y (longitude and latitude) should be smaller than Upper-right X,Y; 2. All longitudes and latitudes should be in ASCII format as follows:- Longitude: DDDMM.MMMM,E/W. 4 places of decimal. ‘0’ is needed to be stuffed if no value available. Latitude: DDMM.MMMM,N/S. 4 places of decimal. ‘0’ is needed to be stuffed if no value available; 3. Send W******,017 or W******,117 without data to disable this function.
Presetting by SMS for GPRS tracking		
Set ID for VT310N by SMS	W******,010,ID	Tracker ID must be less than 14 digits
Set APN by SMS	W******,011,APN,APN Name, APN Password	APN Name, APN Password If no

		password required, just insert APN name only; APN defaulted as 'CMNET'; APN name + password not over 39 characters.
Set IP Address and Port by SMS	W******,012,IP, Port	IP: xxx.xxx.xxx.xxx Port: [1,65536]
Enable GPRS Function	W******,013,X	X=0, close GPRS (default); X=1, enable TCP X=2, enable UDP
Set Time Interval for Sending GPRS Packet	W******,014,XXXXX	XXXXX should be in five digitals and in unit of 10 seconds. XXXXX=00000,to disable this function; XXXXX=00001~65535, time interval for sending GPRS packet and in unit of 10 seconds.
Output Control	W******,020,P,F	P =1, Out1 =2, Out2 =3, Out3 =4, Out4 =5, Out5 F =0, to disable the output =1, to enable the output
Output Control (Safe mode) This function is achievable when the speed is below 10km/h and GPS is available.	W******,120,ABCDE	ABCDE represents Out1, Out2, Out3, Out4, Out5 respectively. If A or B or C or D or E, =0, to disable the output =1, to enable the output =2, to remain previous status
Set power saving mode when VT310N is still (In power saving mode, GPS stops working. GSM enters standby mode and stop sending out message until it is activated by an SMS or an incoming call)	W******,026,XX	XX=00, to disable this function XX=01~99, to set this function. It is in unit of minute. Example: If XX=10, VT310N will enter power saving mode in 10 minutes after it is immobile.
Set phone number for wiretapping	W******,030,T	T is the telephone number for wiretapping and max. 16 digits
Set time zone difference	W******,032,T	T=0, to disable this function

		T=[1, 65535] to set time difference in minutes to GMT. Default value is GMT +, not necessary for those ahead of GMT. For example, either +120 or 120 is acceptable. -, required for those behind GMT. For example, -120.
Set character for SOS alert message	W******,033,P,Char	Char P is the button number. P=1, 2, or 3. Char is the character in SOS message and max 32 characters
Set tracking by driving angle change function	W******,036,Degree	Measured by Degree(s), Degree=0,disable this function；X=1-359，means set angle degree interval in this function.
Set tracking by distance function	W******,045,X	Measured by Meter(s), X=0, disable this functio；X=1—65535，means the distance interval in this function.
Set clear/reset odometer function	W******,046	To clear and reset odometer information to zero.
Set function of receiving location physical address name via SMS	W******,111	This function need support of the GPRS01 or SMS01 tracking platform, address SMS will be received in text format.
Get version and serial number	W******,600	To get version and serial number of current firmware
Get IMEI No.	W******,601	To get device IMEI No.
Reboot GPS and GSM Module	W******,900###	### is the ending character.
Initialization To turn all the parameters / settings (except for the password) to factory default.	W******,990,099###	### is the ending character.
Password Initialization	W888888,999,666	This command will reset the current password to factory default password 000000